

WHAT IS CLAIMED IS:

1. A magnetoresistive effect thin-film magnetic head, comprising:

a lower shield layer;

an upper shield layer;

a magnetoresistive effect multilayer in which a current flows in a direction perpendicular to surfaces of layers of said magnetoresistive effect multilayer, said magnetoresistive effect multilayer being formed between said lower shield layer and said upper shield layer, and being electrically connected with said lower shield layer and said upper shield layer; and

an insulation gap layer formed between said lower shield layer and said upper shield layer, at least a part of said insulation gap layer being made of an insulation material with a dielectric constant lower than that of Al_2O_3 .

2. The magnetoresistive effect thin-film magnetic head as claimed in claim 1, wherein all of said insulation gap layer is made of an insulation material with a dielectric constant lower than that of Al_2O_3 .

3. The magnetoresistive effect thin-film magnetic head as claimed in claim 1, wherein said insulation material with a dielectric constant lower than that of Al_2O_3 is Si_3N_4 .

4. The magnetoresistive effect thin-film magnetic head as claimed in claim 1, wherein said insulation material with a dielectric constant lower than that of Al_2O_3 is $\text{Co-}\gamma\text{Fe}_2\text{O}_3$. Hematite

5. The magnetoresistive effect thin-film magnetic head as claimed in claim 1, wherein said insulation material with a dielectric constant lower than that of Al_2O_3 is SiO_2 .

6. The magnetoresistive effect thin-film magnetic head as claimed in claim 1, wherein said magnetoresistive effect multilayer is a tunnel magnetoresistive effect multilayer including a tunnel barrier layer and a pair of ferromagnetic thin-film layers between which said tunnel barrier layer is sandwiched.

7. The magnetoresistive effect thin-film magnetic head as claimed in claim 1, wherein said magnetoresistive effect multilayer is a current perpendicular to the plane giant magnetoresistive effect multilayer including a nonmagnetic metal layer, and a pair of ferromagnetic thin-film layers between which said nonmagnetic metal layer is sandwiched.

8. A magnetoresistive effect thin-film magnetic head, comprising:

a lower shield layer;

a lower gap layer made of a nonmagnetic electrically conductive material and laminated on said lower shield layer;

a magnetoresistive effect multilayer in which a current flows in a direction perpendicular to surfaces of layers of said magnetoresistive effect multilayer, said magnetoresistive effect multilayer being laminated on said lower gap layer;

an upper gap layer made of a nonmagnetic electrically conductive material and laminated on said magnetoresistive effect multilayer;

an insulation gap layer formed around said magnetoresistive effect multilayer and said upper gap layer, at least a part of said insulation gap layer being made of an insulation material with a dielectric constant lower than that of Al_2O_3 ; and

an upper shield layer laminated on said upper gap layer and said insulation gap layer.

9. The magnetoresistive effect thin-film magnetic head as claimed in claim 8, wherein all of said insulation gap layer is made of an insulation material with a dielectric constant lower than that of Al_2O_3 .

10. The magnetoresistive effect thin-film magnetic head as claimed in claim 8, wherein said insulation material with a dielectric constant lower than that of Al_2O_3 is Si_3N_4 .

11. The magnetoresistive effect thin-film magnetic head as claimed in claim 8, wherein said insulation material with a dielectric constant lower than that of Al_2O_3 is $\text{Co-}\gamma\text{Fe}_2\text{O}_3$.

12. The magnetoresistive effect thin-film magnetic head as claimed in claim 8, wherein said insulation material with a dielectric constant lower than that of Al_2O_3 is SiO_2 .

13. The magnetoresistive effect thin-film magnetic head as claimed in claim 8, wherein said magnetoresistive effect multilayer is a tunnel magnetoresistive effect multilayer including a tunnel barrier layer and a pair of ferromagnetic thin-film layers between which said tunnel barrier layer is sandwiched.

14. The magnetoresistive effect thin-film magnetic head as claimed in claim 8, wherein said magnetoresistive effect multilayer is a current perpendicular to the plane giant magnetoresistive effect multilayer including a nonmagnetic metal layer, and a pair of ferromagnetic thin-film layers between which said nonmagnetic metal layer is sandwiched.